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Presentation1

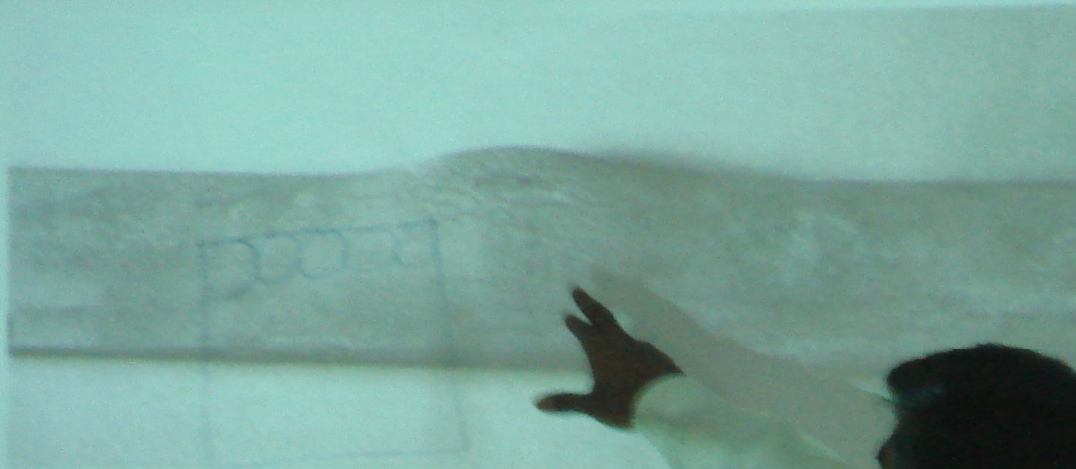












- LONG TERM OVERHEATING
- • Little to moderate bulging
- • Little to moderate reduction in wall thickness
- • Typically accompanied by thermal oxidation
- • Found in superheaters, reheaters, water walls





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**Causes of high temperature creep**

Restriction of the tube's coolant flow internally by scale, debris, or condensate

- Reduction of heat transfer capability due to internal (steam-side) surface oxide scales or chemical deposits
- Periodic Over firing or uneven firing of fuel burners
- Blockage of boiler gas passages
- Operation of a tube material at temperatures higher than allowable
- Increases in stress due to wall thinning





















# Water-Side Corrosion

- Caustic Corrosion

Hydrogen

- Pitting (Localized Corrosion)



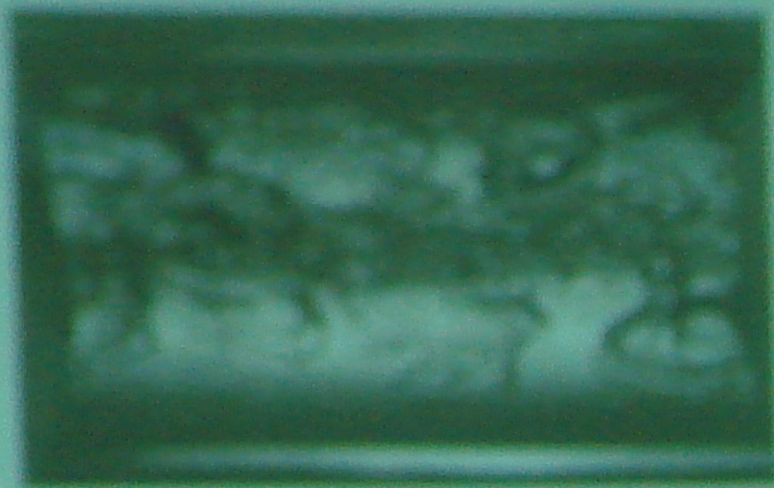


Figure 1

Figure 1 - River channel

Figure 1 - River channel

Figure 1 - River channel

Figure 1 - River channel









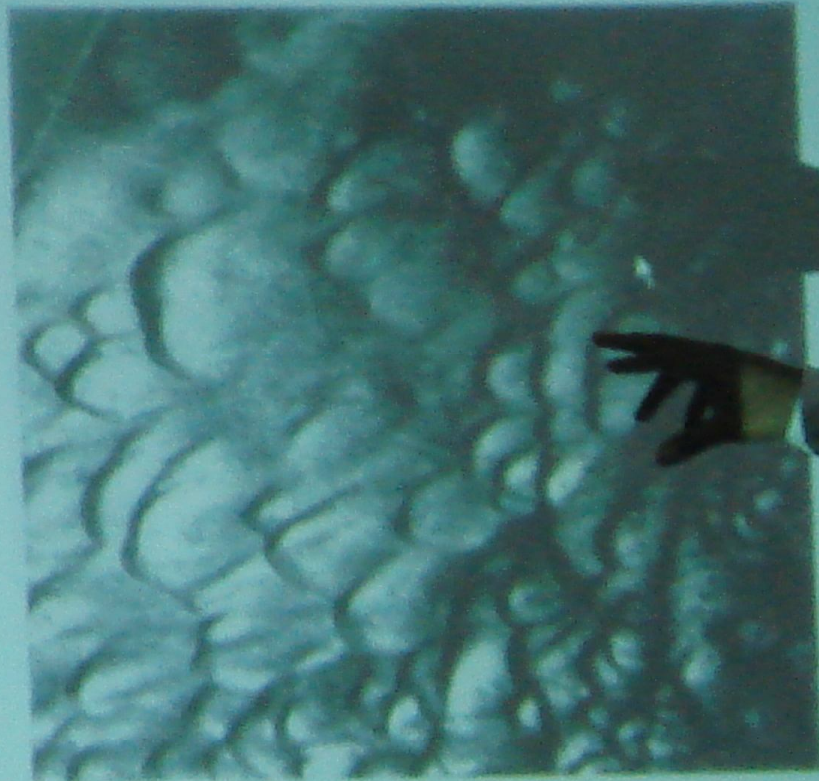






## FLOW ASSISTED CORROSION

- FAC affected by:
  - Temperature
  - pH
  - O<sub>2</sub> concentration
  - Mass flow rate
  - Geometry
  - Quality of fluid
  - Alloys of construction











# Boiler Tube Failure, Prevention and Control

PRESENTED

BY  
SUNDARA VEER RAJU

A TRAINING PROGRAM BY MECWEL (INDIA)



# Boiler Tube Failure Prevention and

PRESENTED

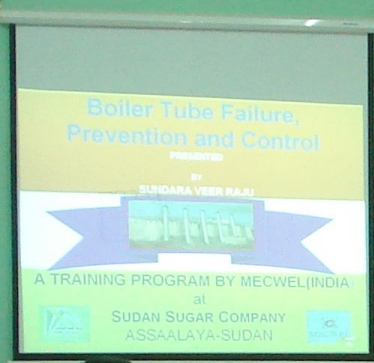
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# Boiler Tube Failure, Prevention and Control









# Boiler Tube Failure, Prevention and Control

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A TRAINING PROGRAM BY MECWEL (INDIA)



ANY





# Boiler Tube Failure Prevention and

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and Control  
LIMITED  
BY  
VEER RAJU



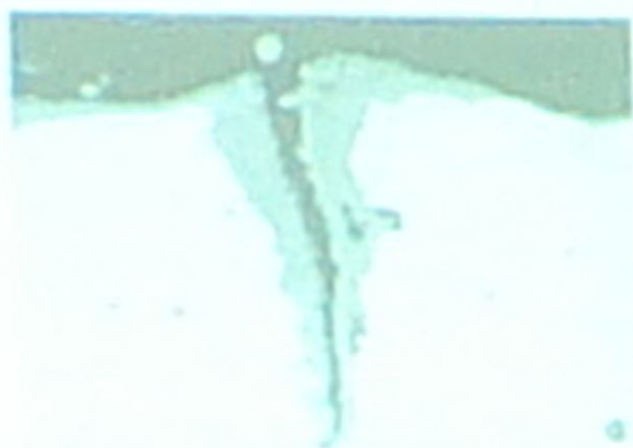
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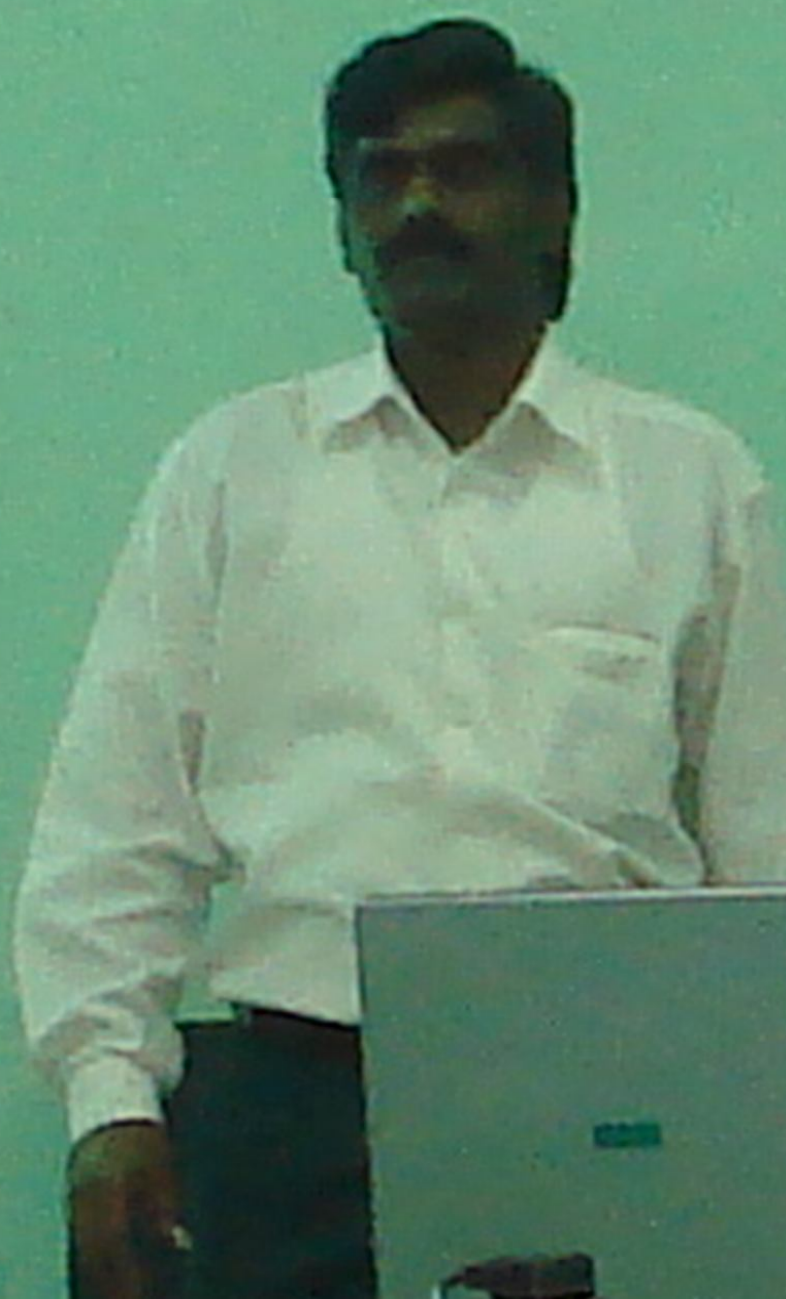
and crazing, oxide wedge

thermal fluctuations

gradients and mechanical constraint

evaporating flows in waterwalls

failures of entire superheaters





## Causes of high temperature creep

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- Increases in stress due to wall thinning





# Power plant Dictionary

SUNDARA VEER RAJU

MECWEL(INDIA)OMT







# **BOILER TUBE ANALYSIS**

**BY  
S.V. RAJU**

**A TRAINING PROGRAM BY MECWEL(INDIA)**

**ASSALAYA      SUDAN**





# **BOILER TUBE FAILURE, PREVENTION AND CONTROL**

**Veer Raju Sundara** . D.M.E., B.O.E., (B.E)

A TRAINING PROGRAM of  
**MECWEL(INDIA) O.M.T**  
at  
**SUDAN SUGAR COMPANY**  
Assalaya  
**SUDAN**

## **Introduction**

The content of this short presentation is to give you the ability to:

- Explain **four reasons** why large number of boiler tube failures. i.e. same failure mechanism, same root-cause, same tube, etc., occur in boilers
- Describe the **six requirements** for a formalized boiler tube failure prevention program
- Discuss **twenty-two common tube failure mechanisms** in terms of typical locations, appearances; root causes corrective action, etc

**Definition:** A boiler tube is considered to have a failure when its pressure boundary is broken by a leak or rupture, or prone to be broken due to wall thinning before the next scheduled boiler inspection.





**BOILER  
TUBE ANALYSIS**

BY

A TECHNICAL PAPER BY THE KILN/BOILER  
SUDAN





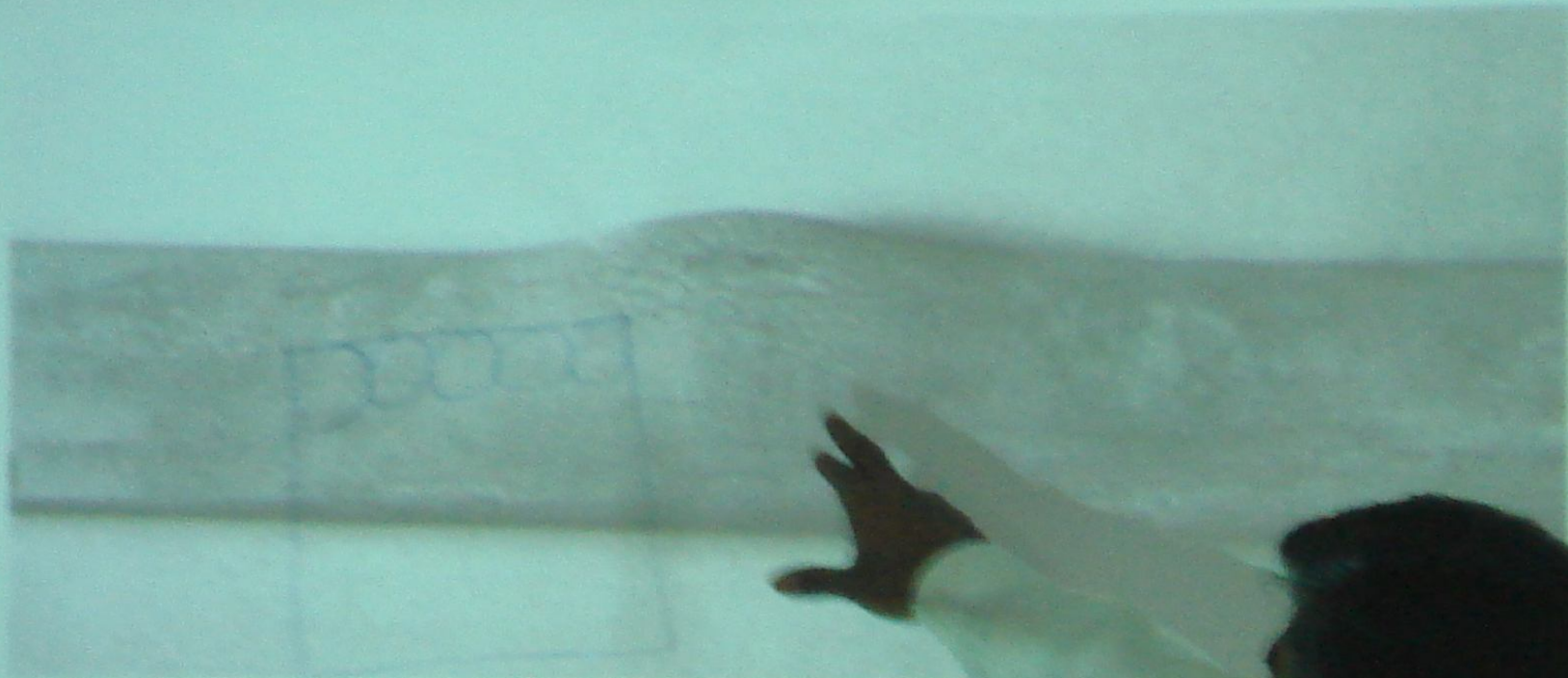












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